



## Case Report

## *Chlamydia trachomatis* infection in children: Do not forget perinatal acquisition A case report of a 7-year old girl, *C. trachomatis* infected, presumed sexually assaulted

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## ABSTRACT

A 7-year old girl suspected of having been sexually abused owing to the presence of anal condyloma was found to be infected by *Chlamydia trachomatis*. Microbiological analysis and anamnesis were consistent with the infection having been acquired at birth. This case confirms that untreated infection acquired at birth can persist for months or years and highlights the value of examining those involved in the suspicion of sexual abuse of the child.

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## 1. Introduction

In children, isolation of a sexually transmitted organism may be the indication that abuse has occurred. *Chlamydia trachomatis* is recognized as the most prevalent cause of sexually transmitted infection in adults. *C. trachomatis* infection in children is frequently considered to be an indicator of sexual abuse but may be a prolonged infection following perinatal acquisition. We report on the case of a young girl, seen at the CAUVA (Emergency Reception Centre for Victims of Aggression) in Bordeaux, France because of the presence of anal condyloma suspected to have been acquired after sexual abuse.

## 2. Forensic observation

## 2.1. The child

A 7-year old girl was referred to the CAUVA in Bordeaux upon a requisition from the Gendarmerie following the demand of the Public Prosecutor for suspicion of sexual abuse by the girl's father.

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The clinical examination of the child revealed perianal condyloma. The forensic examination failed to find any hymenal defloration. No wart-type skin lesion was found elsewhere on the day of the clinical examination. Vulval and anal samples were taken by swabbing, along with a blood sample for the detection of agents responsible for sexually transmitted diseases. Antibodies for hepatitis B and C, herpes, CMV, HIV and syphilis were sought for. *Trichomonas vaginalis* was tested by direct examination of the vaginal smear stained with May Grönwald Giemsa under an optic microscope. Detection was undertaken in the vaginal and anal samples for *Neisseria gonorrhoeae* (culture on selective agar) and *C. trachomatis* (culture on McCoy cells and PCR by using Cobas Amplicor kit from Roche laboratories). All results were negative except for *C. trachomatis*. The *C. trachomatis* PCR was positive in the vulval sample and negative in the anal sample whereas the *C. trachomatis* culture remained negative in both samples. Typing of the papilloma virus was also performed but was negative for the probes 6/11, 16/18 and 31/33/51.

*C. trachomatis* infection was confirmed on further samples, collected from the child 15 days and 3 weeks later. The vaginal samples gave a positive PCR result three times and the cultures remained negative. Testing for anti *C. trachomatis* antibody using a *C. trachomatis* specific Elisa technique found a high level of IgG (IgG ratio = 3.1 for a positivity threshold of 1.1) and barely positive IgA (IgA ratio = 1.3 for a positivity threshold of 1.1).

The child was treated by electro-dissection of the perianal condyloma and with antibiotics (Macrolides) for one month.

The child's medical history included a period of hospitalisation at the age of 2 months for respiratory distress. The clinical examination recorded the presence of congestion and cough since birth together with conjunctivitis which persisted over one month. No etiological diagnosis was made at the time of the clinical symptoms.

### 2.2. The presumed perpetrator of sexual abuse

In this context of suspicion of sexual abuse, urethral, anal and blood samples were taken three times (after 1 and 2 months) from the presumed perpetrator of this sexual abuse to detect agents responsible for sexually transmitted diseases. All the results of these samples remained negative, in particular for *C. trachomatis*.

The man presented a penile wart that was biopsied for histological analysis but it was impossible to establish any link between the child's condyloma and this penile wart.

### 2.3. The mother

An endocervical sample and a blood sample were also taken from the mother for the detection of *C. trachomatis* infection. *C. trachomatis* was found in culture and by PCR in the cervical sample. The serodiagnosis evidenced the presence of high level of IgG (IgG ratio = 3.2) without IgA.

Genotyping of the strain isolated in the mother and detected by PCR in the child was performed using the PCR–RFLP technique.<sup>1</sup> The two strains proved to be of the same serovar.

All the results are shown in Table 1.

From the ethical point of view: the consent of the minor patient's representatives was obtained first, for the testing and second, for publication in a scientific journal as long as the anonymity is preserved. This data are protected and anonymous, according to the French law "informatics and liberties" and on biomedical researches.

The presumed perpetrator gave informed consent to the testing. From the legal angle, the physician was working under a judge's warrant.

**Table 1**

Results of the direct and indirect detection of *C. trachomatis* in the child, the mother and the presumed perpetrator of sexual abuse.

Date of samples	PCR <sup>a</sup>	Cell culture <sup>b</sup>	Genovar of the strain <sup>c</sup>	Serology <sup>d</sup>
Child				
July 1, 2003	+	—	E	
July 16, 2003	+	—		
July 27, 2003	+	—		IgG = 3.1 IgA = 1.3
Mother				
October 7, 2003	+	+	E	IgG = 3.2 IgA = 0.7
Presumed perpetrator				
July 9, 2003	—	—		IgG = 0.5 IgA = 0.5
August 5, 2003	—	—		IgG = 0.4 IgA = 0.6
October 7, 2003	—	—		IgG = 0.9 IgA = 0.8

<sup>a</sup> Cobas AmpliCor kit, Roche diagnostics.

<sup>b</sup> Culture on McCoy cells. Inclusions revealed by fluorescent monoclonal antibodies against the major outer membrane protein.

<sup>c</sup> Genotyping by PCR–RFLP of the *omp1* gene (1).

<sup>d</sup> Elisa serology, BMD kit, CT Sero, Savayon Israel, with the following interpretation: ratio <0.9 negative, >1.1 positive.

## 3. Discussion

This 7-year old girl had lesions consistent with condyloma acuminata, or genital warts, which are caused by the human papilloma virus (HPV). In adults, transmission of genital HPV is through direct sexual contact but also by infected towels and clothing. In children, the methods of transmission are more ambiguous.<sup>2</sup> Perinatal transmission, digital inoculation, and fomite and sexual transmission have all been proposed. Perinatal infection from contamination by infected amniotic fluid or an infected birth canal is well documented, although the actual risk of developing condyloma acuminata from a mother with HPV is unknown. Digital inoculation has been proposed as a means of HPV transmission secondary to the isolation of HHPV-2 in pediatric genital lesions. Fomite transmission and nonsexual contact have been proposed as a means of HPV transmission. Recently, an epidemiological study of HPV suggested that many anogenital HPV infections among preadolescent children are a result of nonsexual horizontal transmission, acquired either perinatally or postnatally. It seems that many children >2 years of age acquire HPV infection from nonsexual contact.<sup>3</sup>

However, in the context of sexual abuse, it was relevant to look for other sexually transmitted infections. The Centre for Disease Control (CDC) recommends detection for *C. trachomatis* and *N. gonorrhoeae* from the vagina/urethra, rectum and pharynx when sexual abuse is suspected as well as other tests for STIs.

In this case report, the child was infected by *C. trachomatis* as proven by the PCR results and serology. The clinical, microbiological and anamnesis results supported that the *C. trachomatis* infection was acquired at birth and probably not from sexual abuse. Firstly, the presence of *C. trachomatis* was proved in the child in several samples and the presence of antibodies suggested that the infection was not recent. Secondly, the clinical examination performed at the time of the occurrence failed to reveal any hymenal defloration. Thirdly, the mother was found to be infected with a genovar strain identical to that in the child, whereas the presumed perpetrator showed no infection. The results do not exclude the possibility of a prior infection in the man insofar as if the infection was superficial it would not generate antibodies, but they do exclude the possibility of the man being infected at the time of the occurrence. Finally, the symptoms reported during the first 3 months of life are characteristic of a *C. trachomatis* infection acquired during the passage through the birth canal. It is impossible to exclude definitively the possible acquisition of *C. trachomatis* infection after birth because of a possible sexual intercourse of the mother with another partner but all data taken together inclined to favour the hypothesis of *C. trachomatis* infection acquired at birth.

The diagnosis of *C. trachomatis* infection was established in the child on the basis of the PCR results. CDC, however, recommends that only standard culture systems for the isolation of *C. trachomatis* should be used<sup>4</sup> in cases of sexual abuse. Nonculture tests for chlamydia (e.g. nonamplified probes, EIAs, and DFA) are not sufficiently specific for use in circumstances involving possible child abuse or assault. Because of the legal implications, the highest possible specificity is required and is more important than sensitivity in such situations.<sup>5</sup> Data are insufficient to adequately assess the usefulness of nucleic acid amplification tests in the evaluation of children who may have been sexually abused. In our case, *C. trachomatis* infection was confirmed by culture and PCR in the mother and only by PCR in the child. In the child, the PCR result was confirmed in three consecutive samples and the diagnosis of *C. trachomatis* infection cannot be doubted.

*C. trachomatis* is a relatively common sexually transmitted pathogen. In France, the prevalence of *C. trachomatis* infection varies

according to the populations, from 3% in the general population to over 10% in high risk populations attending STD screening or family planning centres.<sup>6,7</sup> The prevalence of *C. trachomatis* infection in prepubertal girls who are suspected victims of sexual abuse has generally been <2%. Everett et al. reported a prevalence of genital infections with *C. trachomatis* of 1.3% in 2973 girls evaluated for sexual abuse over a 16 year period.<sup>8</sup>

*C. trachomatis* is usually transmitted to newborns via exposure to an infected mother's genital flora during passage through the birth canal. The prevalence in pregnant women is unknown in metropolitan France but can reach 26% in Martinique, French west Indies.<sup>9</sup> The risk of transmission from an infected mother to her infant at delivery is approximately 50%.<sup>10</sup> The infant may become infected at one or more anatomical sites including the conjunctiva, nasopharynx, rectum and vagina.<sup>2</sup> The most frequent clinical disease is neonatal conjunctivitis which occurs in 20–50% of infants born to infected mothers and 3–18% of infants develop pneumonia. The diagnosis of these last infections may be difficult and may cause confusion if detected at a later date, as described here. In a study<sup>11</sup> of infants born to *C. trachomatis* positive mothers, the organism was cultivated up to 28 months after birth. There are reports of perinatally acquired rectal, vaginal and nasopharyngeal infections persisting for at least 3 years<sup>12</sup> and even 6 years.<sup>13</sup>

In both the mother and the children, the infection had been developing at least since the birth of the child, i.e. 7 years. Apart from the period of hospitalisation at the age of 3 months for respiratory distress, the medical records of the two persons failed to show any referral for genital symptoms. In the mother the fact that the culture of *C. trachomatis* was positive confirms the evolution of the infection despite the absence of symptoms. The high level of IgG in the mother pleads for an infection evolving since a long time.

In conclusion, the most likely hypothesis in this child is a neonatal *C. trachomatis* infection. The presence of a *C. trachomatis* infection in a child is not therefore systematically the consequence of sexual abuse. Similarly, the presence of condyloma in the anogenital area linked to the presence of a wart on the skin is not pathognomonic of sexual abuse.

The analysis of this case highlights the value of additional examinations in the persons concerned by the suspicion of sexual abuse on the child, in particular for the presumed perpetrator but also for the mother. This could be recommended in a practice guideline.

## Conflicts of Interest

No conflict of interest has to be declared.

## Funding and Ethical Approval

All the ethical points have been revised by the reviewers and copies documents have already been sent to them. All samples have been collected according to the penal procedures in French law on request of the instruction's judge.

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